

Claims

WHAT IS CLAIMED IS:

- 5 1. An integrated differential receiver for an input/output pad comprising:
 a single gate oxide differential receiver; and
 a switchable voltage supply circuit, operatively coupled to the single gate
 oxide differential receiver, switchable through at least one control signal to select a
 differential receiver supply voltage for the single gate oxide differential receiver wherein
 10 at least one of the selected supply voltages is different from an input/output pad supply
voltage.
- 15 2. The receiver of claim 1 wherein the switchable voltage supply circuit selects the
 differential receiver supply voltage that is a higher voltage than the I/O pad supply
 voltage.
3. The receiver of claim 1 including an isolation output buffer operatively coupled to
 a receiving circuit that outputs a signal.
- 20 4. The receiver of claim 1 wherein the differential receiver receives a first reference
 voltage on a first differential input and an input voltage on a second differential input and
 wherein the switchable voltage supply circuit selects the differential receiver supply
 voltage for the single gate oxide differential receiver to be a voltage level higher than a
 maximum voltage level of the input voltage.
- 25 5. The receiver of claim 1 wherein the switchable voltage supply circuit provides
 either of at least an I/O pad supply voltage and a second reference supply voltage for the
 differential receiver based on the control signal such that the reference voltage is selected
 as the differential receiver supply voltage when the control signal indicates a maximum
 30 input signal voltage to be less than the second reference voltage, and wherein the
 switchable voltage supply circuit provides the I/O pad supply voltage as the differential

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receiver supply voltage when the control signal indicates a maximum input signal voltage to be greater than the second reference voltage.

5 6. The receiver of claim 1 wherein the switchable voltage supply circuit is operatively responsive to at least two control signals.

10 7. The receiver of claim 1 wherein the single gate oxide differential receiver includes a transistor, operatively coupled to an input transistor of a single gate differential input stage having a gate coupled to the first reference voltage, a source coupled to the single gate oxide differential receiver supply voltage, a drain coupled to a drain of the input transistor that receives the input signal.

15 8. The receiver of claim 1 wherein the receiver generates an output signal to circuitry for a video graphics processor.

20 9. The receiver of claim 1 wherein the switchable voltage supply circuit includes a plurality of voltage switching circuits operative to alternately activate a common current source to selectively provide the differential receiver supply voltage for the single gate oxide differential receiver.

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10. An integrated differential receiver for an input/output pad comprising:
 a single gate oxide differential receiver that receives a first reference voltage on a first differential input and an input voltage on a second differential input;
 a switchable voltage supply circuit, operatively coupled to the single gate oxide differential receiver, switchable through at least one control signal to select a differential receiver supply voltage for the single gate oxide differential receiver wherein at least one of the selected supply voltages is a voltage level higher than a maximum voltage level of the input voltage; and
 an isolation output buffer operatively coupled to core logic.

11. The receiver of claim 10 wherein the switchable voltage supply circuit provides either of at least an I/O pad supply voltage and a second reference supply voltage for the differential receiver based on the control signal such that the reference voltage is selected as the differential receiver supply voltage when the control signal indicates a maximum input signal voltage to be less than the second reference voltage, and wherein the switchable voltage supply circuit provides the I/O pad supply voltage as the differential receiver supply voltage when the control signal indicates a maximum input signal voltage to be greater than the second reference voltage.

12. The receiver of claim 11 wherein the switchable voltage supply circuit is operatively responsive to at least two control signals.

13. The receiver of claim 11 wherein the single gate oxide differential receiver includes the single gate oxide differential receiver includes a transistor, operatively coupled to an input transistor of a single gate differential input stage having a gate coupled to the first reference voltage, a source coupled to the single gate oxide differential receiver supply voltage, a drain coupled to a drain of the input transistor that receives the input signal.

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14. A method for controlling a voltage supply for a differential receiver comprising the steps of:

providing either of at least an I/O pad supply voltage and a second reference supply voltage for a single gate oxide differential receiver based on a control signal such that the reference supply voltage is selected as the differential receiver supply voltage when the control signal indicates a maximum input signal voltage to be less than the second reference voltage, and

providing the I/O pad supply voltage as the differential receiver supply voltage when the control signal indicates a maximum input signal voltage to be greater than the second reference voltage.

15 The method of claim 14 including the step of buffering an output signal from the single gate oxide differential receiver prior to the output signal being received by core circuitry.

16 The method of claim 14 including receiving a first reference voltage on a first differential input and an input voltage on a second differential input and selecting the differential receiver supply voltage for a single gate oxide differential receiver to be a voltage level higher than a maximum voltage level of the input voltage.

17 The method of claim 14 including providing either of at least an I/O pad supply voltage and a second reference supply voltage for a differential receiver based on the control signal such that the reference voltage is selected as the differential receiver supply voltage when the control signal indicates a maximum input signal voltage to be less than the second reference voltage, and providing the I/O pad supply voltage as the differential receiver supply voltage when the control signal indicates a maximum input signal voltage to be greater than the second reference voltage.

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